

STATE OF VERMONT
PUBLIC SERVICE BOARD

Docket No. 6860

Petitions of Vermont Electric Power Company, Inc. and Green Mountain Power Corporation for a Certificate of Public Good authorizing VELCO to construct the so-called Northwest Vermont Reliability Project, said project to include: (1) upgrades at 12 existing VELCO and GMP substations located in Charlotte, Essex, Hartford, New Haven, North Ferrisburgh, Poultney, Shelburne, South Burlington, Vergennes, West Rutland, Williamstown, and Williston, Vermont; (2) the construction of a new 345 kV transmission line from West Rutland to New Haven; (3) the construction of a 115 kV transmission line to replace a 34.5 kV and 46 kV transmission line from New Haven to South Burlington; and (4) the reconductoring of a 115 kV transmission line from Williamstown, to Barre, Vermont

PREFILED DESIGN DETAIL TESTIMONY OF
DAVID RAPHAEL ON BEHALF OF THE
VERMONT DEPARTMENT OF PUBLIC SERVICE

October 14, 2004

Summary: Mr. Raphael's testimony addresses whether the proposed project, if constructed consistent with the design detail provided by VELCO for selected sections of the Northwest Vermont Reliability Project, will have an undue adverse effect on aesthetics and scenic beauty.

1 Q1 Please state your name, occupation, and place of employment.

2 A1 My name is David Raphael and I am a Professional Landscape Architect and Planner as
3 well as a Lecturer in the School of Natural Resources at the University of Vermont. My
4 primary place of employment is at LandWorks, 211 Maple Street, Middlebury, Vermont.

5
6 Q2. Have you previously presented testimony in this docket?

7 A2. Yes. I presented testimony in the direct, reroute, and surrebuttal phases of this
8 proceeding.

9
10 Q3. What is the purpose of this testimony?

11 A3. The purpose of this testimony is to address whether the proposed project, if constructed
12 consistent with the design detail provided by VELCO for selected sections of the
13 Northwest Vermont Reliability Project, will have an undue adverse effect on aesthetics
14 and scenic beauty.

15
16 Q4. Have you reviewed VELCO' s design detail prefiled testimony and exhibits?

17 A4. Yes I have. Using the Quechee analysis and my previous reviews and testimony as a
18 point of departure, I reviewed the design detail for each segment VELCO addressed in its
19 design detail filing. I will address each segment separately, beginning with Route 7 and
20 Salisbury Road.

21

22

1 Q5. Does VELCO's design detail for Route 7 and Salisbury Road effectively mitigate the
2 impact on aesthetics under the Quechee test? If not, why not?

3 A5. The VELCO proposed mitigation measures that include plantings along Route 7 offer
4 insufficient mitigation south of the West Salisbury Road intersection and north of the
5 same intersection. In the immediate vicinity of the intersection and on West Salisbury
6 Road, the mitigation measures proposed are sufficient.

7
8 Although the use of a hedgerow and roadside planting was one of the mitigation options I
9 previously recommended, the design detail proposal does not include a hedgerow and
10 does not implement screen planting in a manner that works for the stretch of the Route 7
11 corridor beginning at the southern most point in West Salisbury, at which point the line is
12 visible from Route 7 to approximately 2000 feet south of the intersection with West
13 Salisbury Road and again beginning 250 feet north of the intersection and continuing to
14 the north until the corridor route is no longer visible.

15
16 I remain concerned that the plantings along Route 7, both south and north of the
17 intersection, will be less effective, particularly in winter, in sufficiently screening the two
18 sets of poles and associated elements and in particular, along the lengthier stretch of the
19 highway south of the intersection. For example, Exhibit TJB DD-2, Section 1-H3
20 (hereinafter, all references to Exhibit TJB DD-2 are designated by Section and page only)
21 shows extensive gaps, which would be addressed better by a continuous hedgerow in this
22 location. I must add, however that I do not believe that the proposed plantings as shown

1 in Section 1-1B are sufficient to avoid an undue adverse impact, and I believe that the
2 relocation option proposed in DPS-DR- 1 for the corridor area that includes poles 207 to
3 226 as currently proposed (Salisbury Mile Marker 18.0-20.0) is still the appropriate way
4 to mitigate this section of the line.

5
6 The street tree plantings around the intersection work more effectively, as shown in
7 simulation Section 1-D3 and in the planting Section 1-1B, and thus I believe in this short
8 section effective mitigation to satisfy Quechee has been achieved.

9
10 Q6. Does VELCO's design detail for Route 7 and Route 125 effectively mitigate the impact
11 on aesthetics under the Quechee test? If not, why not?

12 A6. It is difficult to fully ascertain the effectiveness of this mitigation approach without a
13 more panoramic view and simulation on Route 125 heading both west and east, so I have
14 to reserve my ultimate conclusion until I can understand the broader picture.

15 Nonetheless, I do believe that, given what has been provided in Section 2-B and in
16 photographs and simulations Section 2 C-1 and D-5, the mitigation may be sufficient to
17 avoid an undue adverse determination, with the possible exception of the proposed riser
18 structure, as discussed below. In addition to the panoramic view, the view and impacts
19 looking east as one travels Route 125 are the most important, as it this orientation and
20 travel route that constitutes a gateway to a scenic region. Based on the design detail
21 provided, it seems apparent that this view will be improved, particularly if the vegetative
22 plug remains in front of the new pole on the south side of 125, with the single existing

1 115 kV structure on the north side (rather than an additional new 345kV structure), and
2 with the undergrounding of the distribution lines. The only qualification is the riser
3 structure. I would urge VELCO to consider setting this back further from the road to
4 reduce its prominence and visibility. This is an instance where existing conditions that
5 include distribution poles and lines as well as the existing 115kV and 46kV lines create a
6 situation that is not highly scenic or aesthetically pleasing. Again, the most important
7 view, in my mind is the easterly view as one enters onto 125 and conditions have been
8 improved for this particular orientation. Thus, with my qualifications addressed
9 satisfactorily, and particularly as to the riser structure, I believe an undue adverse impact
10 can be avoided here.

11
12 Q7. Does VELCO's design detail for the New Haven substation effectively mitigate the
13 impact on aesthetics under the Quechee test? If not, why not?

14 A7. This question cannot be considered without of necessity involving both the Route 17
15 crossing and proposed rerouting, which provides for a different entry of the lines into the
16 substation area, and opening up the landscape more extensively in so doing. Because
17 VELCO has not implemented the rerouting approach, and because VELCO has not
18 adopted the necessary buffering/screening of that portion of the substation which is
19 visible from Route 17 which I recommended in my direct testimony, and which I have
20 now come to believe is the only way to effectively mitigate the potential for an undue
21 adverse impact here, I must conclude the potential for an undue, adverse impact still
22 exists. The rerouting mitigation option, along with the berming and mixed hedgerow

1 plantings collectively will mitigate the adverse impact of both the new line and the
2 expanded substation and therefore they need to be considered together, in this sense.
3 VELCO's design detail does not incorporate my recommendations for berming and
4 planting on the north side of the substation, which I believe will sufficiently reduce the
5 visual impact here so as to avoid an undue adverse impact. The increased infrastructure
6 and visibility of the project as currently proposed by VELCO can be successfully
7 mitigated by reasonable means, as set forth in my testimony. The proposed increase in
8 footprint and structures will make the substation more visible in this highly scenic and
9 sensitive area and the two separate corridors with their two sets of poles and conductors,
10 at two different sag heights will create an unnecessary and sustained visual impact over
11 800 feet in distance.

12
13 As shown in Sections 3-C and 3-D of the design detail, only four ash trees are proposed,
14 which would eventually screen the structures effectively, although it would take at least
15 ten years to do so. The proposed white spruce trees would be well below the height of
16 the tall A-frame structures and would not provide effective screening for ten to twenty
17 years. Elevating these plantings on a gradual berm and using larger trees initially would
18 not only screen the substation more effectively, and perhaps within 5 years or less, but
19 would also provide a different feel in the landscape and allow the eye to focus on a sweep
20 of field and hedgerow, rather than a line of plants and the structures behind them.

21

1 It is also important to note that a predominant planting of single species, as indicated in
2 Section 3-C of the design detail, also may serve to emphasize the planting mitigation
3 rather than de-emphasize it. A more natural mix of native species of both deciduous and
4 evergreen species might allow the hedgerow to blend in better with the surrounding
5 landscape over time.

6
7 With regard to lighting, the photometric plans provided for the substation indicate that, in
8 this instance, light trespass will be kept to a minimum and the distance from any potential
9 viewers, along with existing and proposed screening, will be sufficient to address
10 visibility and glare. The only concern would be an unnatural glow that would emanate
11 from the site when the lights are on. Given VELCO's previous representations and
12 testimony that the lights will only be on when there is nighttime work or visits, and that
13 they will not be lit on a regular or daily basis, I am satisfied that they will not cause an
14 undue adverse impact in this instance.

15
16 Q8. Does VELCO's design detail for the Route 17 crossing effectively mitigate the impact on
17 aesthetics under the Quechee test? If not, why not?

18 A8. No it does not. I do not believe relocating only the proposed upgraded line will be
19 sufficient to avoid an undue adverse impact at this location. In this panoramic scenic
20 gateway to the village of New Haven and the Green Mountains, with its highly valued
21 scenic views both to the Green Mountains and the Adirondacks, the addition of new
22 double pole structures will push this project in this location over the Quechee threshold

1 and will be considered offensive by the average person. As with the substation,
2 reasonable mitigation measures are available and have not been employed. By separating
3 the corridors into two locations, the impacts have been extended over a longer distance,
4 800 feet of visibility along Route 17 and thus affect the traveler for a longer period of
5 time than would otherwise be necessary. This is not an improvement. Even with the
6 poles set back further from the highway at the top of the rise, the mitigation will not be
7 effective. In this regard, the simulations do not show the true extent of the view and do
8 not demonstrate where the eye is drawn to in that view (to the sweeping panoramas in
9 both directions). The simulations for this area should be more panoramic and not
10 selected for the one or two spots where existing vegetation hides them when set back,
11 because the screening from that vegetation is minimal and not at all effective in screening
12 the project's visibility along the long stretch of the highway from which the two sets of
13 lines will be visible, at least for 1/2 to 3/4 of a mile. Finally, the proposed relocation of
14 the new line is too far from the edge of the tree line to take advantage of the
15 backgrounding potential of the vegetation and to limit its impact to the open space of the
16 agricultural area and this is much less desirable than the option proposed in my
17 recommendations. It can be and should be moved to within 50 to 75 feet of the tree line
18 at the maximum, instead of the 200-feet or more as proposed.

19
20
21 Q9. Does VELCO's design detail for the Ferrisburgh Slang effectively mitigate the impact on
22 aesthetics under the Quechee test? If not, why not?

1 A9. Generally, I agree with the setback of the new poles in the Slang and with the description
2 provided in Mr. Boyle's testimony. However, I do not agree with the extent of the
3 clearing proposed in Section 5-B (although it is hard to gauge exactly what is proposed in
4 this area because the information provided is insufficient in detail). We need to know
5 exactly how much existing vegetation will be removed and how much will be retained
6 and what the resulting effectiveness of the screening will be before an assessment of the
7 aesthetic impacts can be made. However, the most critical point here would be to add
8 some native plantings along the banks, which will de-emphasize the pole structures and
9 eventually screen them from boaters, who are low in the water to begin with. Carefully
10 executed, this measure would, along with the pole locations, constitute adequate
11 mitigation.

12
13 Q10. Does VELCO's design detail for the Ferry Road crossing and vicinity effectively mitigate
14 the impact on aesthetics under the Quechee test? If not, why not?

15 A10. VELCO has provided design detail to implement the recommendation first put forward in
16 my Reroute Testimony for pole relocation adjacent to the rail corridor in this area. The
17 design detail provided in Section 6-B places the proposed pole marked 27 further north
18 than we had proposed or considered in recommending this route. In addition, the design
19 detail proposes significant tree removal of existing mature buffer trees, which was not
20 anticipated in my original proposal for this corridor, as the degree of clearing proposed
21 would significantly increase the impact on residences east of the tracks. This is a serious
22 concern insofar as the amount of clearing proposed by VELCO to maintain a 100-foot

1 right-of-way and the need to have an access road to the pole marked 27 removes most of
2 the substantial buffer between the new line and those residences, a result that was not
3 anticipated or intended with my original proposal and leads to the conclusion that the
4 project could offend the sensibilities of those landowners, and an average person would
5 also find the dramatic change offensive and unacceptable. Additional on-site inspection
6 has confirmed the need to remove most of this buffer of maples, several willows, ash and
7 other pioneer species.

8
9 Looking at it objectively, and with a comparable situation potentially occurring at
10 Fletcher Lane in Shelburne, I came to the same conclusion there as well. An average
11 uninvolved individual would most likely find the removal of mature vegetation which
12 separates and screens a transmission line and corridor from a residence or group of
13 residences to be a shocking change, in that it would open up the view and expose
14 residents every day to a structure which is unusually high, for the most part 20 feet or
15 more higher than distribution poles, and with a different conductor array, so as to result in
16 a discordant and out of scale situation. Additionally, in the vicinity of the Ferry Road
17 crossing, with the mature trees removed, the residents on the east side of the tracks would
18 then not only be exposed to the new line, but also lose their buffer to the railroad tracks
19 and industrial/commercial/institutional land uses beyond the tracks. Therefore, I now
20 believe that this proposal cannot be accomplished in a manner that will meet the Quechee
21 test.

1 I have examined the three options for overhead construction in the vicinity of Ferry Road
2 presented to date in this case and do not believe there are sufficient mitigation
3 opportunities for any one of those options to pass the Quechee test. Therefore, as a last
4 resort, I would consider burial of the transmission line for a short distance in this
5 location. However, it is still possible that another overhead design could allow the line to
6 be constructed through this general vicinity in such a way as to meet the requirements of
7 the Quechee test.

8
9 Q11. Please describe those elements in the design detail proposal for the vicinity of Ferry Road
10 that you believe provide effective mitigation and those elements that do not provide
11 effective mitigation.

12 A11. The relocation of the substation away from Ferry Road is a desirable and effective
13 improvement, as is the planting of street trees as shown in Section 6-B. The burial of the
14 distribution lines adds a modest plus to the mitigation measures despite the fact that they
15 require a high riser structure, which may be intrusive if it is not carefully located and dark
16 in color. If you compare the simulations in Sections 6-C3 and 6-C4 the difference is not
17 substantial, and backgrounding is effective in absorbing, that is, downplaying the visual
18 impact and presence of the distribution poles. Burial of the distribution lines at this
19 location would not be necessary to meet the Quechee test, if as a solution of last resort,
20 the transmission line is buried in the vicinity of the Ferry Road crossing. However, if an
21 overhead design is implemented at this location, then burial of the distribution lines could
22 be considered as a desirable mitigation measure.

1 Q12. Does VELCO's design detail for the Bostwick Road crossing effectively mitigate the
2 impact on aesthetics under the Quechee test? If not, why not?

3 A12. With one reservation, discussed in A13 below, I believe VELCO and Mr. Boyle have
4 prepared an effective mitigation plan for this area through the combination of distribution
5 line burial and street tree plantings. In addition, the fact that the line itself, as proposed,
6 does not unduly affect the westward view of travelers, as they do not really have the
7 expanse of the view until they have cleared the bridge (because of orientation and
8 vegetation on either side), assures that the Quechee test will be met in this location.

9
10 Q13. Do you have any concerns or recommendations at this location?

11 A13. My one concern is with the effect of the proposed clearing along Meach Cove Road's
12 east side where the proposed corridor is and I believe it is necessary to maximize the
13 retention of the trees located in this area. I believe we need to consider some exceptions
14 to standard practice here for right-of-way clearing width and the removal of critical
15 buffering trees. Careful consideration of the health of the trees, assuring that only
16 diseased or otherwise compromised trees are removed, analyzing how trees and tree
17 branches will fall, and even the possibility of cabling or guying trees to keep them from
18 falling onto the conductors, could be considered to allow critical screen trees to remain in
19 this location. The health of the trees may be assessed by a qualified arborist and through
20 core borings and other methods. Depending on the extent of tree removal in this area, I
21 would recommend some sort of "vegetative plug" or screening at Meach Cove Road's
22 east side at Bostwick Road. Whereas tree removal is a very sensitive concern at Ferry

1 Road, at this location sufficient trees at and outside of the right-of-way and adjacent to
2 the corridor provide screening and backgrounding to absorb the impact of the proposed
3 project in this location. While the upgrade as proposed will result in an adverse impact,
4 mitigation measures such as careful pole placement, lower pole heights, retention of as
5 much vegetation at the edge of corridor as possible, presence of background vegetation
6 and other landscape elements in the corridor, as well as proposed plantings, provide
7 sufficient mitigation to avoid an undue adverse impact in this section.
8

9 Q14. Does VELCO's design detail for the Bay Road crossing effectively mitigate the impact
10 on aesthetics under the Quechee test? If not, why not?

11 A14. I believe that the option that includes the undergrounding of all of the distribution lines is
12 the preferred option. As I have previously stated, I do not believe this is a highly scenic
13 area and existing conditions and context include an existing array of poles and lines,
14 including the existing 34.5kV transmission lines and distribution lines. The underbuild
15 option is not desirable because it results in higher poles and additional wires, so I favor
16 the underground option for the distribution lines, as it results in the least possible clutter
17 and conductors. Overall this approach (with all of the distribution lines buried) will
18 improve the appearance of Bay Road.
19

20 The approach of burying distribution lines and the proposed mitigation plantings will
21 satisfy Quechee, in my estimation. However, the underbuild option will still pass the
22 Quechee test because it represents another generally available mitigation option and

1 would not offend the sensibilities of the average person who is used to seeing this number
2 of conductors in this vicinity of Bay Road.
3

4 Q15. Does VELCO's design detail for the Granite substation effectively mitigate the impact on
5 aesthetics under the Quechee test? If not, why not?

6 A15. The plans proposed, particularly because VELCO has worked with affected landowners,
7 provides sufficient mitigation to address the potential for visual impact here.
8

9 The only concern I still have has to do with lighting. The photometric plan shown is
10 incomplete and does not show what lighting effects will occur from the lights mounted on
11 the fencing- it only provides photometrics for one pole mounted light and one building
12 mounted light. I thus must reserve judgment on this particular issue until a more
13 complete lighting plan is provided. The distinction between this situation and that of the
14 New Haven substation is based on two considerations: 1) residences are much closer here
15 to the substation than to the New Haven site; and 2) the level of screening is not as
16 extensive here as it is around the New Haven site, therefore there still exists the
17 possibility of visual impacts of the lighting on the nearby residences.
18

19 Q16. Does this conclude your testimony?

20 A16. Yes it does.